

CLAIMS:

1. A multiaxial antenna chip, comprising:  
a core, which includes at least two arm portions, each  
5 arm portion extending in a direction different from the other  
arm portion; and  
coil portions, wherein each arm portion has a coil  
portion provided about it.
- 10 2. The multiaxial antenna chip according to claim 1,  
wherein the core is shaped generally like a cross, wherein the  
arm portions include an X-axis arm portion and an Y-axis arm  
portion, the Y-axis arm portion extending perpendicular to the  
X-axis arm portion, and wherein the coil portions include an  
15 X-axis coil portion provided about the X-axis arm portion and  
an Y-axis coil portion provided about the Y-axis arm portion.
3. The multiaxial antenna chip according to claim 2,  
further comprising a Z-axis coil portion provided about a Z  
20 axis that extends perpendicular to the X-axis arm portion and  
the Y-axis arm portion.
4. The multiaxial antenna chip according to claim 3,  
wherein the cross-shaped core has four radially outer tips,  
25 and wherein the Z-axis coil portion formed by winding an  
electric wire along lines that are parallel to lines passing  
through the tips of the core.
5. The multiaxial antenna chip according to claim 4,  
30 wherein the Z-axis coil portion is arranged such that the Z-  
axis coil portion does not protrude radially outward beyond  
the tips of the core.

6. The multiaxial antenna chip according to claim 3, wherein the Z-axis coil portion is displaced from the core in relation to a direction of the Z-axis.

5        7. The multiaxial antenna chip according to claim 3, further comprising a casing for accommodating the core, wherein the Z-axis coil portion is wound about the casing.

10       8. The multiaxial antenna chip according to claim 3, further comprising a plurality of contacts, each contact being connected to one of the coil portions, wherein the contacts extend through, and are fixed to, a circuit board on which the multiaxial antenna chip is mounted.

15       9. The multiaxial antenna chip according to claim 8, wherein, when the multiaxial antenna chip is viewed along the Z axis, the contacts are arranged asymmetrically.

20       10. The multiaxial antenna chip according to claim 3, further comprising a claw portion, wherein the claw portion extends through, and is engaged with, a circuit board on which the multiaxial antenna chip is mounted.

25       11. The multiaxial antenna chip according to claim 2, wherein the core includes an X-axis core piece and a Y-axis core piece, wherein the core pieces extend perpendicular to each other and are laid on top of each other, and wherein the X-axis core piece includes the X-axis arm portion, and the Y-axis core piece includes the Y-axis arm portion.

30       12. The multiaxial antenna chip according to claim 11, wherein the core pieces are laid on top of each other such that portions of the core pieces that are not laid on top of each other are in the same plane.

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13. The multiaxial antenna chip according to claim 11,  
wherein at least one of the core pieces has a concave portion  
at a section that is laid on top of the other core piece,  
wherein the other core piece is engaged with the concave  
5 portion.

14. The multiaxial antenna chip according to claim 11,  
wherein at least one of the core pieces is bent such that a  
section that is laid on top of the other core piece is  
10 displaced relative to the remainder of the bent core piece in  
a direction away from the other core piece.

15. The multiaxial antenna chip according to claim 2,  
wherein the X-axis arm portion is a pair of X-axis arm  
15 portions that extend in opposite directions from a center of  
the core, wherein the Y-axis arm portion is a pair of Y-axis  
arm portions that extend in opposite directions from the  
center of the core, wherein the X-axis coil portion is a pair  
of X-axis coil portions, each corresponding to one of the X-  
20 axis arm portions, and wherein the Y-axis coil portion is a  
pair of Y-axis coil portions, each corresponding to one of the  
Y-axis arm portions.

16. The multiaxial antenna chip according to claim 11,  
25 wherein the X-axis coil portion is provided only in a section  
of the X-axis core piece that is not laid on top of the Y-axis  
core piece, and wherein the Y-axis coil portion is provided  
only in a section of the Y-axis core piece that is not laid on  
top of the X axis core piece.

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17. The multiaxial antenna chip according to claim 11,  
wherein the X-axis coil portion is provided both in a section  
of the X-axis core piece that is laid on top of the Y-axis  
core piece and in a section of the X-axis core piece that is  
35 not laid on top of the Y-axis core piece, and wherein the Y-

axis coil portion is provided both in a section of the Y-axis core piece that is laid on top of the X-axis core piece and in a section of the Y-axis core piece that is not laid on top of the X-axis core piece.

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18. The multiaxial antenna according to claim 1, wherein the core is flexible.

10 19. The multiaxial antenna according to claim 18, wherein the core is constructed by stacking a plurality of flexible sheets.

15 20. The multiaxial antenna chip according to claim 7, wherein the core includes an X-axis core piece and a Y-axis core piece, wherein the core pieces extend perpendicular to each other and are laid on top of each other, and wherein the X-axis core piece includes the X-axis arm portion, and the Y-axis core piece includes the Y-axis arm portion.

20 21. The multiaxial antenna chip according to claim 20, further comprising a plurality of contacts, each contact being connected to one of the coil portions, wherein the contacts extend through, and are fixed to, a circuit board on which the multiaxial antenna chip is mounted.

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